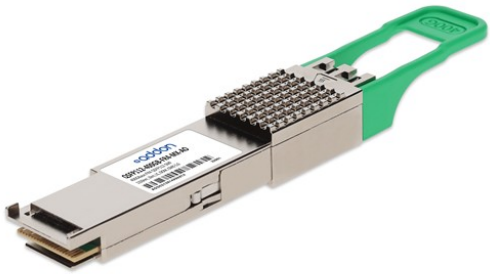
QSFP112-400GB-FR4-MX-AO

NVIDIA® Compatible TAA 400GBase-FR4 QSFP112 Transceiver (SMF, 1310nm, 2km, LC, DOM, CMIS 5.0)

Features:

- Compliant with 400GBASE-FR4
- Compliant with QSFP112 MSA
- Compliant with IEEE802.3ck Standard 400GAUI-4 C2M Electrical Interface
- CMIS 5.0
- Class 1 Laser
- Duplex LC Connector
- Operating Temperature: 0 to 70 Celsius
- 2-Wire Interface with Digital Diagnostic Monitoring
- RoHS Compliant and Lead-Free



Applications:

- 400GBase Ethernet
- Access and Enterprise

Product Description

This NVIDIA® compatible QSFP112 transceiver provides 400GBase-FR4 throughput up to 2km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It can operate at temperatures between 0 and 70C. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with NVIDIA®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

AddOn's transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S.-made or designated country end products."

TAA COMPLIANT

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0		70	°C	
Relative Humidity	RH	5		89	%	
Supply Voltage	Vcc	-0.5		3.6	V	
Signaling Rate Per Lane			53.125 ± 100ppm		Gbd	PAM4
Operating Distance		2		2000	m	

Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage		Vcc	3.135	3.3	3.465	V	
Instantaneous Peak Current at Hot Plug		Icc_IP			4000	mA	
Sustained Peak Current at Hot Plug		Icc_SP			3300	mA	
Maximum Power Dissipation		PD			10	W	
Maximum Power Dissipation (Low-Power Mode)		PD_{LP}			1.5	W	
2-Wire Serial Interface Clock Rate					400	kHz	
Module Sinusoidal Power Supply Noise Tolerance 1kHz - 1MHz (Pk-Pk)					66	mVp-p	
Rx Differential Data Output Load				100		Ω	
Transmitter							
Differential Pk-Pk Input Voltage Tolerance (TP1a)			750			mV	
Pk-Pk AC Common-Mode Voltage Tolerance	**Low-Frequency (VCMLF)**				32	mV	
	Full-Band (VCMFB)				80		
Effective Return Loss		ERL	8.5			dB	
Differential Termination Mismatch					10	%	
Single-Ended Voltage Tolerance Range			-0.4		3.3	V	
DC Common-Mode Voltage Tolerance			-0.35		2.85	V	
Differential-Mode to Common-Mode Return Loss		RLcd	802.3ck 120G-2			dB	
Receiver							
Pk-Pk AC Common-Mode Voltage	**Low-Frequency (VCMLF)**				32	mV	
	Full-Band (VCMFB)				80		
Differential Pk-Pk Output Voltage	**Short-Mode**				600	mV	
	Long-Mode				845		

Eye Height	EH	15			mV	
Vertical Eye Closure	VEC			12	dB	
Effective Return Loss	ERL	8.5			dB	
Differential Termination Mismatch				10	%	
Transition Time		8.5			ps	
DC Common-Mode Voltage Tolerance		-0.35		2.85	V	
Common-Mode to Differential-Mode Return Loss	RLDc	802.3ck 120G-1			dB	
Low-Speed Signal						
Module Output SCL and SDA	VOL	0		0.4	V	
Module Input SCL and SDA	VIL	-0.3		Vcc*0.3	V	
	VIH	Vcc*0.7		Vcc+0.5	V	
LPMode/TxDis, ResetL, and ModSelL	VIL	-0.3		0.8	V	
	VIH	2		Vcc+0.3	V	
IntL/RxLOS	VOL	0		0.4	V	
	VOH	Vcc-0.5		Vcc+0.3	V	

Optical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter							
Center Wavelength		λC	1264.5	1271	1277.5	nm	
			1284.5	1291	1297.5		
			1304.5	1311	1317.5		
			1324.5	1331	1337.5		
Side-Mode Suppression Ratio		SMSR	30			dB	
Average Launch Power Per Lane		AOP_L	-3.2		4.4	dBm	1
Outer Optical Modulation Amplitude (OMAouter) Per Lane		T_{OMA}			3.7	dBm	
Outer Optical Modulation Amplitude (OMAouter) Per Lane	**TDECQ<1.4dB**	T_{OMA}	-0.2				
	1.4≤TDECQ≤3.4dB		-1.6+TDECQ				
Difference in Launch Power Between Any Two Lanes (OMAouter)		DP			3.9	dB	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ) Per Lane		TDECQ			3.4	dB	
Transmitter Eye Closure for PAM4 (TECQ)		TECQ			3.4	dB	
| TDECQ - TECQ |					2.5	dB	
Over/Under-Shoot					22	%	
Transmitter Power Excursion					1.8	dBm	

Average Launch Power of Off Transmitter Per Lane		Toff			-16	dBm	
Extinction Ratio Per Lane		ER	3.5			dB	
Transmitter Transition Time					17	ps	
$RIN_{17.1}OMA$		RIN			-136	dB/Hz	
Optical Return Loss Tolerance		ORL			17.1	dB	
Transmitter Reflectance		TR			-26	dB	
Receiver							
Center Wavelength		λC	1264.5	1271	1277.5	nm	
			1284.5	1291	1297.5		
			1304.5	1311	1317.5		
			1324.5	1331	1337.5		
Damage Threshold Per Lane		AOP_D	5.4			dBm	
Average Receive Power Per Lane		AOP_R	-7.2		4.4	dBm	2
Receive Power (OMAouter) Per Lane		OMA_R			3.7	dBm	
Difference in Receive Power Between Any Two Lanes (OMAouter)		DR			4.1	dB	
Receiver Reflectance		RR			-26	dB	
Receiver Sensitivity (OMAouter) Per Lane	**TECQ<1.4dB**	SOMA			-4.6	dBm	
	1.4≤TECQ≤3.4dB				-6+TECQ		
Stressed Receiver Sensitivity (OMAouter) Per Lane		SRS			-2.6	dBm	3
Stressed Eye Closure for PAM4 (SECQ)				3.4		dB	
OMAouter of Each Aggressor Lane				1.4		dBm	

Notes:

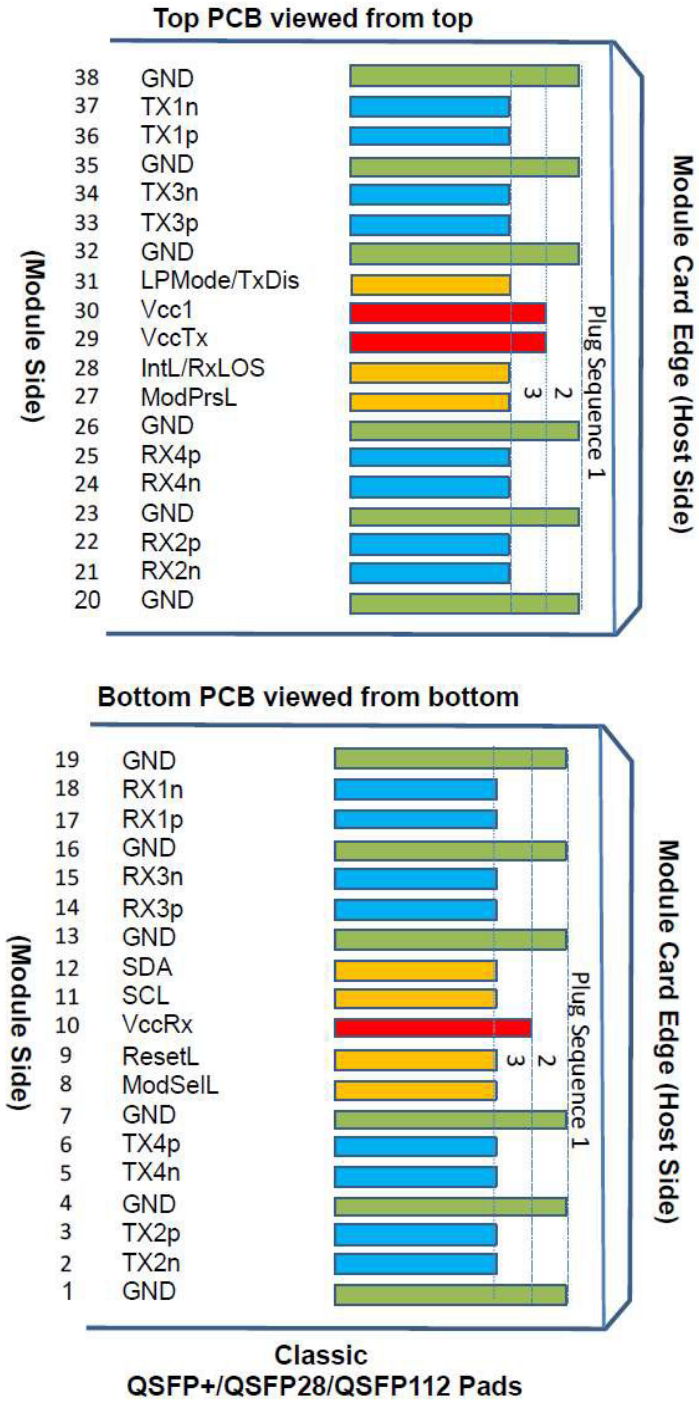
1. Average launch power, per lane (minimum), is informative and not the principal indicator of signal strength.
2. Average receive power, per lane (minimum), is informative and not the principal indicator of signal strength.
3. Measured with conformance test signal at TP3 for the BER=$2.4x10^{-4}$.

Pin Descriptions

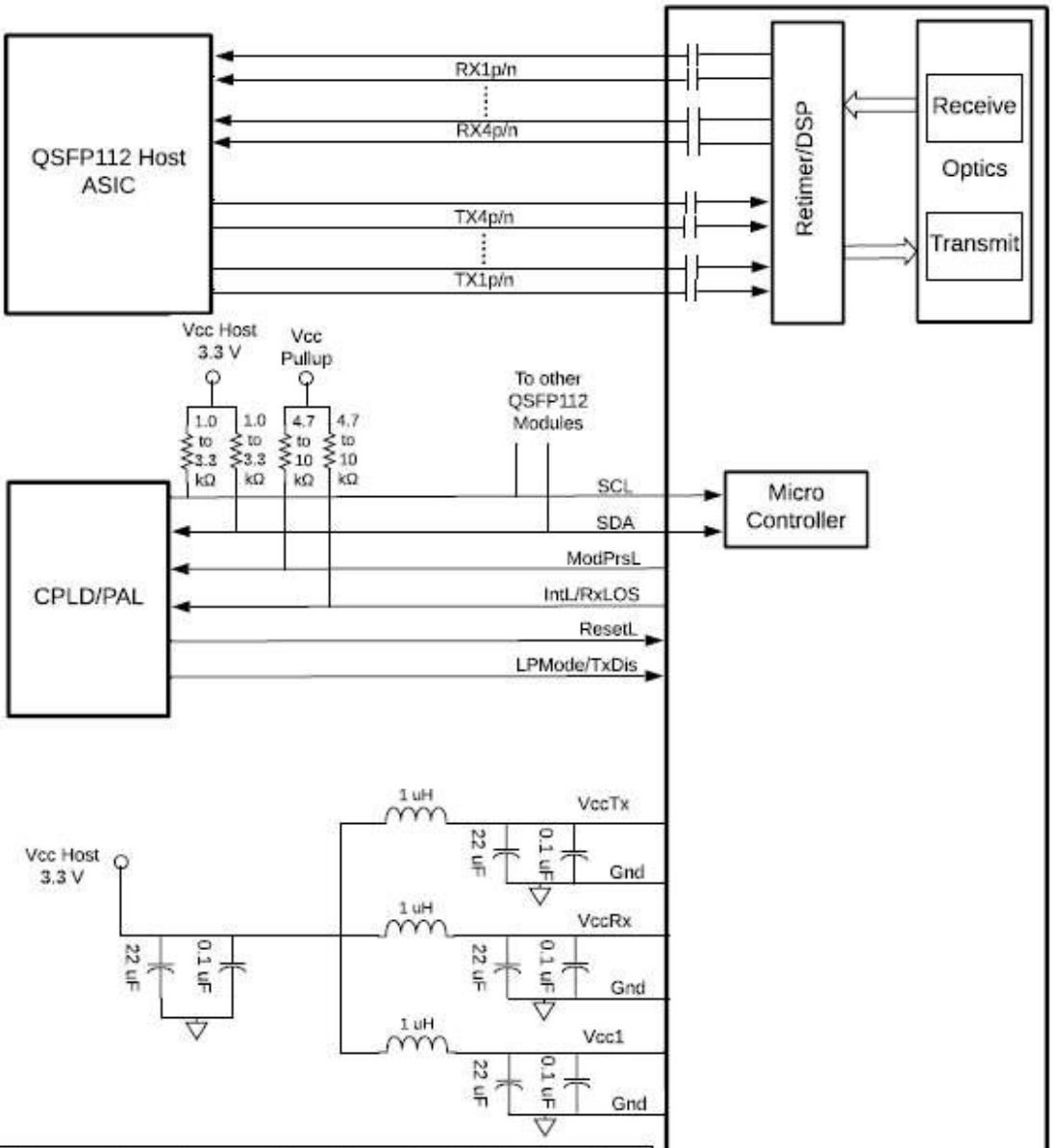
Pin	Symbol	Logic	Name/Description	Notes
1	GND		Module Ground.	1
2	Tx2-	CML-I	Transmitter Inverted Data Input.	
3	Tx2+	CML-I	Transmitter Non-Inverted Data Input.	
4	GND		Module Ground.	1
5	Tx4-	CML-I	Transmitter Inverted Data Input.	
6	Tx4+	CML-I	Transmitter Non-Inverted Data Input.	
7	GND		Module Ground.	1
8	ModSelL	LVTTL-I	Module Select.	
9	ResetL	LVTTL-I	Module Reset.	
10	VccRx		+3.3V Receiver Power Supply.	2
11	SCL	LVCMOS-I/O	2-Wire Serial Interface Clock.	
12	SDA	LVCMOS-I/O	2-Wire Serial Interface Data.	
13	GND		Module Ground.	1
14	Rx3+	CML-O	Receiver Non-Inverted Data Output.	
15	Rx3-	CML-O	Receiver Inverted Data Output.	
16	GND		Module Ground.	1
17	Rx1+	CML-O	Receiver Non-Inverted Data Output.	
18	Rx1-	CML-O	Receiver Inverted Data Output.	
19	GND		Module Ground.	1
20	GND		Module Ground.	1
21	Rx2-	CML-O	Receiver Inverted Data Output.	
22	Rx2+	CML-O	Receiver Non-Inverted Data Output.	
23	GND		Module Ground.	1
24	Rx4-	CML-O	Receiver Inverted Data Output.	
25	Rx4+	CML-O	Receiver Non-Inverted Data Output.	
26	GND		Module Ground.	1
27	ModPrsL	LVTTL- O	Module Present.	
28	IntL/RxLOS	LVTTL- O	Interrupt/Optional RxLOS.	
29	VccTx		+3.3V Transmitter Power Supply.	2
30	Vcc1		+3.3V Power Supply.	2
31	LPMode/TxDis	LVTTL- I	Low-Power Mode/Optional Tx_Disable.	
32	GND		Module Ground.	1
33	Tx1+	CML-I	Transmitter Non-Inverted Data Input.	
34	Tx1-	CML-I	Transmitter Inverted Data Input.	
35	GND		Module Ground.	1

36	Tx1+	CML-I	Transmitter Non-Inverted Data Input.	
37	Tx1-	CML-I	Transmitter Inverted Data Input.	
38	GND		Module Ground.	1

Pin-Out Details



Recommended Host Board Schematic

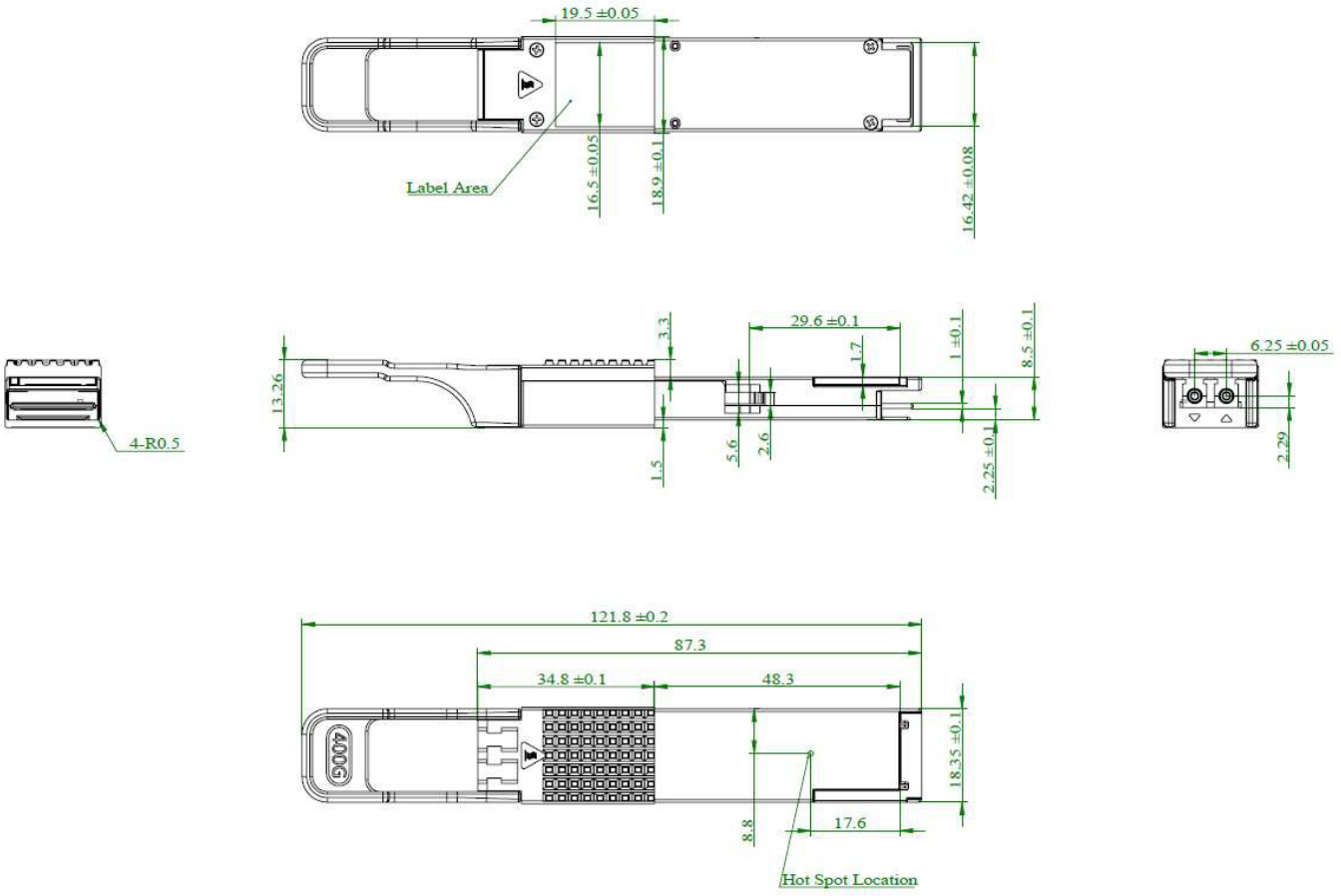


QSFP112 Optical Module

Note: Filter capacitors values are informative and application dependent, 0.1 µF capacitors should be placed in close proximity to power pads and may be duplicated for individual pads to provide additional high frequency filtering.

Note: Vcc1 may be connected to VccTx or VccRx within the module provided the applicable derating of the maximum current limit is used.

Mechanical Specifications



About AddOn Networks

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is ingrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications ranging from NEBS Level 3 to ISO 9001:2015 with every new development while maintaining the signature reliability of its products.



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